

4.11 Exponential Functions

Name _____ Date _____ Period _____

Approximate the value using a calculator. Express answer rounded to three decimal places.

1. a) $2^{3.14}$ b) $2^{3.141}$ c) $2^{3.1415}$ d) 2^π

2. a) $3.1^{2.7}$ b) $3.14^{2.71}$ c) $3.141^{2.718}$ d) π^e

3. a) $e^{1.2}$ b) $e^{-1.3}$

Determine whether the given function is linear, exponential, or neither. For those that are linear functions, find the linear function that models the data; for those that are exponential, find an exponential function that models the data.

4.

x	f(x)
-1	3
0	6
1	12
2	18
3	30

5.

x	f(x)
-1	2
0	5
1	8
2	11
3	14

6.

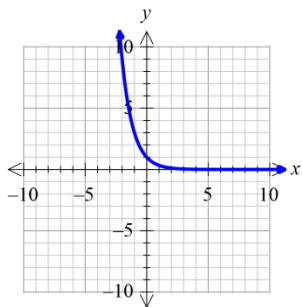
x	f(x)
-1	1/4
0	1
1	4
2	16
3	64

The graph of an exponential function is given. Match the graph to one of the following functions.

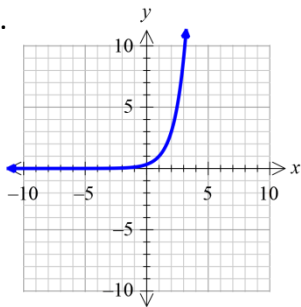
a) $y = 3^x$ b) $y = 3^{-x}$ c) $y = -3^x$ d) $y = -3^{-x}$

e) $y = 3^x - 1$ f) $y = 3^{x-1}$ g) $y = 3^{1-x}$ h) $y = 1 - 3^x$

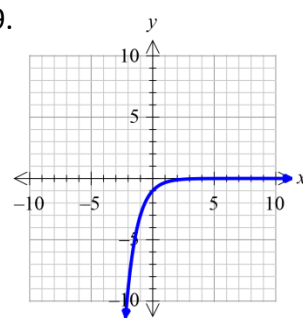
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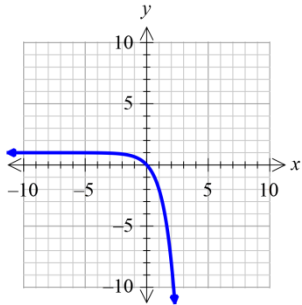
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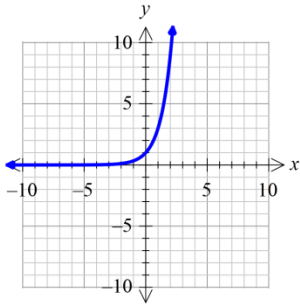
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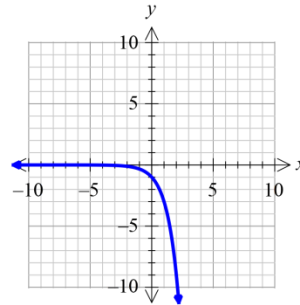
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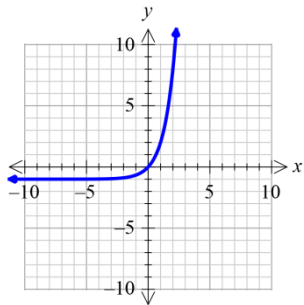
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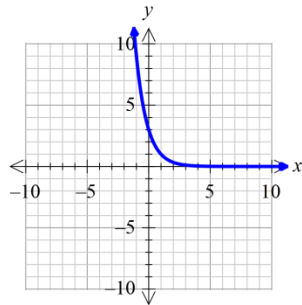
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13.



14.



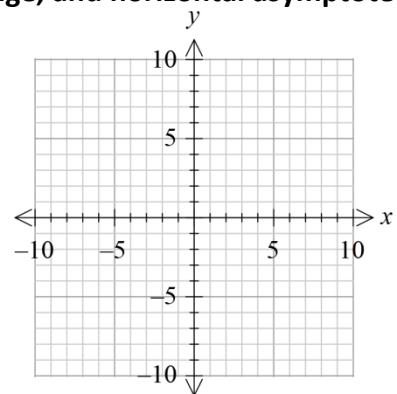
Use transformations to graph each function. Determine the domain, range, and horizontal asymptote of each function. Use a table! No Graphing Calculator! Show work!

15. $f(x) = 2^x + 1$

Domain _____

Range _____

H. A. _____

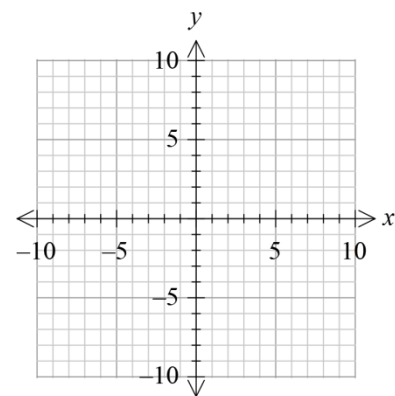


16. $f(x) = 3^{x-1}$

Domain _____

Range _____

H. A. _____

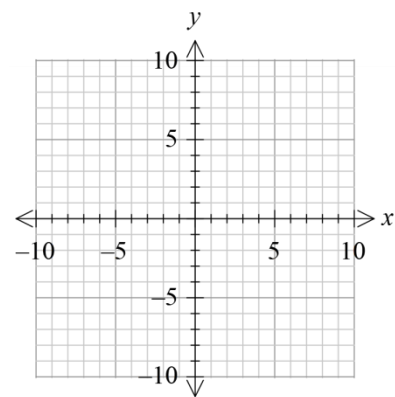


17. $f(x) = 2 + 3^{x/2}$

Domain _____

Range _____

H. A. _____



Solve each equation using the one-to-one property for exponents. Show work!

18. $7^x = 7^3$

19. $\left(\frac{1}{4}\right)^x = \frac{1}{64}$

20. $3^{-x} = 81$

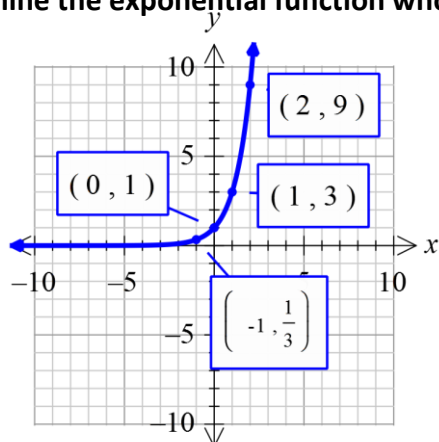
21. $4^{x^2} = 2^x$

22. $9^{-x+15} = 27^x$

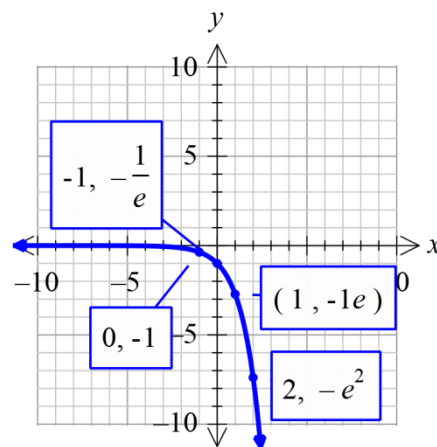
23. $4^x \cdot 2^{x^2} = 16^2$

Determine the exponential function whose graph is given.

24.



25.



Review Exercises

Find the domain of the given functions. Show work!

$$26. \quad f(x) = \frac{\sqrt{x+2}}{(x-3)(x+5)}$$

$$27. \quad f(x) = \sqrt{-2x+7}$$

Find the average rate of change for the given function on the specified interval. Show work!

$$28. \quad f(x) = 2x^2 - 5x + 1 \text{ on } [-1, 7]$$

Solve the equations by using substitution. Show work!

$$29. \quad 2(x-1)^2 - (x-1) = 3$$

$$30. \quad 4x^{\frac{4}{3}} + 35x^{\frac{2}{3}} - 9 = 0$$